International SSAC training courses

An IAEA programme assists countries in developing systems of accountancy and control of nuclear material

by Olan Gene Bates

State Systems of Accounting for and Control of Nuclear Material (SSACs) are widely recognized as a vital element in achieving effectiveness and credibility for international safeguards. A nation's SSAC must also satisfy national objectives, such as accounting for all safeguarded material and detecting losses or unauthorized removal of material.

In recent years the Agency has placed an increasing emphasis on assisting Member States in developing their State systems of accountancy and control of nuclear material. The programme actually began with a panel meeting in Tokyo in November 1973 at which the essential requirements of State systems in compliance with international safeguards agreements were outlined and discussed. In July 1975 the responsibilities and activities of State systems were discussed in greater detail at an advisory group meeting in Brno, Czechoslovakia, with emphasis on some optional State system activities.

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In 1975, in the course of the Brno advisory group meeting, it was noted by several participants that there was a need for an Agency-sponsored training programme related to the organization and operation of State systems, and a separate advisory group meeting on that subject was recommended.

Preparation for the advisory group on training programmes began almost immediately, with the calling of an informal meeting of consultants in early December 1975. The advisory group meeting took place in Vienna in March 1976, and it was opened by the Director General of the IAEA. He noted that the establishment of nuclear materials accountancy and control systems in States embarking on nuclear power programmes was a very important element in international safeguards. He expressed the belief that the Agency could play an important role in the development of such systems, and that one way of providing this assistance was through the organization of a series of training courses.

The advisory group on SSAC training gave primary attention to the organization of a basic training course

Informal discussions between course technical staff and participants facilitate understanding of SSACs.

Participants practice the application of their newly acquired knowledge in NDA laboratory exercises and design workshops.

for Member States whose nuclear power programmes are still in the early stages. The advisory group also made several suggestions relating to more advanced training courses or seminars. It was expected that the first advanced course would be held in early 1978, which in fact it was.

The first "Basic Training Course for Personnel of State Systems of Accounting for and Control of Nuclear Material" was held in Vienna in November 1976 and was followed by visits to selected nuclear facilities in the Federal Republic of Germany. The course was attended by 27 individuals from 18 Member States. Primary emphasis was given to two topics, namely (1) Fundamentals of Nuclear Materials Accountancy, and (2) Organization, Activities and Responsibilities of the State System. Guest lecturers described material control systems in their countries, and discussed materials accountancy practices and problems in their State systems, and numerous discussion periods were scheduled in order to encourage audience participation. In addition to the primary topics, lectures were also presented on the history of international safeguards, on physical protection of nuclear materials and nuclear facilities, and on a description of the Agency's international safeguards system.

The second basic training course was held at IAEA headquarters in May/June 1977. No facility visits were arranged, but the basic course content was the same as that given in the first training course. This second basic training course was attended by 35 persons from 25 countries.

Formal training courses are not the Agency's only activity related to State systems of nuclear materials accountancy and control. In autumn 1977 some 17 persons participated in a month-long study tour involving three days of lectures in Vienna, two weeks of

Participation by Member States in SSAC Courses, 1978–87

Countries	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Argentina									1	2
Australia						1		1	1	1
Bangladesh						1		1		
Belgium				1						
Bolivia				1				1		
Brazil		2	2	1	2	2		1	1	2
Bulgaria				2			1		2	1
Canada		1	1	1	2	1		1		
Chile		1	1							
China								4	3	6
Cuba									3	
Czechoslovakia	3	2		1	3	1	2	1	1	
Egypt	1		2	2		1	3	3		2
Finland					2					
France		1			1	1				
German Dem. Rep.	1			2	1		2		2	
Germany, Fed. Rep.			1							
Greece	1									
Hungary			1	2	1		1	1	1	
India	2	1	2	2	2	2	3	1	2	1
Indonesia	2	1	1					5	4	4
Iran, Islamic Rep. of	1									
Iraq	1			3	3	1		1	1	1
Israel		1	1	1						
Italy			1	2	1				1	1
Japan			1	2	4			7	1	8
Kenya			1							
Korea								1	2	6
Libya				2	1	1				
Luxembourg			1	2						
Malaysia				1	1	1		1	3	1
Mexico	1	1		1						1
Morocco								1		1
Netherlands		1								
Pakistan		1	2	2	2	2		1		1
Peru	1									
Philippines			1	1	2	3		5	2	
Poland	2	2		2	1	2	2	2	1	1
Portugal		1	1							
Rep. of Korea		1	2	1	1	1		4	3	
Romania				1	1		2		1	
South Africa					1	1				1
Spain								1		1
Sweden		1		2	1	2		1		1
Switzerland			1	1						
Thailand							1	2	1	2
Turkey	1		1	2	1					1
USSR							2			
United Kingdom		1								
Venezuela					*			1		
Vietnam									1	
Yugoslavia	1			2	2		1			1
Zaire								1		1
Total 319	18	19	24	43	36	24	20	49	38	48

* Observer

lectures and facility visits in the Soviet Union, three days in the German Democratic Republic, and three days in Czechoslovakia. This four country study tour included extensive visits to operating nuclear facilities, and provided participants with the opportunity to see actual operating nuclear material control systems in action.

Several States have requested, formally or informally, that they be granted fellowships or similar awards permitting extended visits to some country (or several countries) with an operating State system, or that the Agency arrange for suitable experts in the field to visit their country for an extended consulting period, possibly as long as 1 year. There are, however, difficulties in these approaches. Nearly all of the major industrial countries consider that any extended fellowship-type visit would permit the recipient to have an unacceptable degree of access to commercially sensitive information. Thus while such visits are by no means precluded, the duration is more likely to be 3 weeks rather than 3 months to 1 year. At the same time, moreover, most experts in the field who might consult on the development of a State System are urgently needed where they are, and are more likely to be available for consulting visits of 3 weeks rather than 3 months. Nevertheless, in spite of these difficulties, technical co-operation projects have been arranged and others are currently under development. This is a very important complementary measure to the SSAC training courses.

Actually, the first training course organized and conducted in a Member State was in 1978 in Yalta, USSR, under Soviet Union support. The training course evolved naturally out of the two previous courses which were held in Vienna in 1976 and 1977. Subsequently, four additional basic training courses emphasizing power and research reactors have been held in Yalta.

In 1979, a more advanced SSAC course emphasizing safeguards at bulk-processing facilities was presented in Richland, Washington. Sponsored by the US Department of Energy (DOE) in co-operation with the IAEA, the course featured tours of the Exxon Nuclear Company fuel fabrication plant in Richland, as well as lecturers from the IAEA, Exxon, and Battelle Pacific Northwest Laboratories.

Starting in 1980, SSAC training courses in the USA came under the auspices of the Nuclear Non-Proliferation Act of 1978. Los Alamos National Laboratory was asked by the US Government to take the lead in planning and presenting these courses, which have been sponsored by DOE in co-operation with the IAEA. The SSAC course working committees include representatives of DOE, IAEA, Los Alamos, US Nuclear Regulatory Commisssion, US Department of State, The Arms Control and Disarmament Agency, and Exxon Nuclear. Course lecturers have been provided by the IAEA, Los Alamos, the US Government, foreign governments and industrial organizations, as well as by other US national laboratories and US industries. The emphasis of SSAC courses offered in 1980 and 1982 was on safeguarding *item-dominant* facilities, such as power and research reactors and spent-fuel storage facilities. The 1981 and 1983 course material emphasizes safeguards techniques at *bulk facilities*, and in both 1981 and 1983 (as in 1979), Exxon Nuclear provided many of the technical lecturers and allowed access to their plant for tours and demonstrations.

In 1985 Japan took the initiative in organizing, in co-operation with the IAEA, the first regional SSAC course intended for participants from Member States in Far East, South East Asia, and Pacific regions. The course curriculum emphasized research reactors and power reactors with well-planned technical tours to nuclear facilities illustrating the implementation of important features of an SSAC. It also gave participants the opportunity to gain technical information on very interesting advanced facilities.

In 1986 Australia joined the group of Member States providing basic training. Although the curriculum was very similar in nature to other basic courses, a unique opportunity was given to the participants by conducting a technical tour of the mining operations.

In April 1988, Brazil, in co-operation with Argentina and the IAEA will become the first developing country to host an SSAC course. This is a significant step forward in a geographical area where nuclear co-operation has built up among States over the past 5 years under the Agency's regional technical co-operation programme in Latin America, known as ARCAL. The Treaty for the Prohibition of Nuclear Weapons in Latin America, known as the Tlatelolco Treaty, forsees the implementation of safeguards agreements which the States must negotiate and conclude with the IAEA. An SSAC course is likely to have an important effect in the region in helping to ensure the effectiveness of a nuclear-weapon-free zone created by the Treaty and the improvement of safeguards application by the IAEA.

By the end of this year, a total of 17 SSACs will have been conducted. The high degree of participation of Member States in these courses from 1978 onwards is apparent. *(See accompanying table.)* To date, 318 participants from 53 different Member States have attended these courses. This is a substantial, maybe even surprising, number of Member States who are not only interested in but are also *supporting* SSAC training. It goes without saying then that the subject of State systems of accounting for and control of nuclear material continues to be of vital concern to all, and planning for future training courses will be continued.